# CAN GOVERNMENT DELIVER QUALITY RURAL HEALTHCARE? EMPIRICS ON MALARIA PREVENTION AND CONTROL IN NIGERIA

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## ABSTRACT

A large percentage of the Nigerian rural population has been plagued with several disease conditions with deleterious consequence on their health and livelihoods. One of such intractable diseases of the rural population is malaria. The governments of Nigeria and development partners have responded to the malaria scourge with various interventions. These include the Roll-Back-malaria programme, the Millennium Development Goals (Goal 6), national malaria programme, among others. Despite these efforts of the government and stakeholders in health sector, malaria prevention and control seems to be arduous especially in the rural areas, where the poor and vulnerable population live. This study attempted to address the following: (i) What quanta of resources have been invested by government on malaria control and eradication in the country? (ii) Has malaria responded to public investment in its eradication? If, not what factors specifically account for it? (iii) Are the current approaches sufficient to eradicate malaria in rural Nigeria? (iv) What can Nigeria government do to address the malaria eradication problems in the rural areas in the country? To answer these questions secondary data were used to conduct empirical analysis of public expenditure on malaria, malaria morbidity and mortality. The methods of analysis employed were: descriptive statistics, correlation and regression analysis. Result show that despite the attempts made by successive Nigerian administration to control malaria disease in the rural areas, these efforts have not yielded consistent results. Association between sources of funding and malaria were positive. The paper recommends that efforts should be directed towards vaccine production and use of predators as a means of controlling malaria, while funds released should be properly supervised.

**Contribution/ Originality:** This study contributes to the existing literature on the impacts of public expenditure on malaria mortality and morbidity in developing economies so as to help in developing more effective approaches towards its eradication especially in rural communities.

## 1. INTRODUCTION

Malaria is a major public health problem in Nigeria. The World Health Rankings for malaria mortality in 2011 placed Nigeria 11th in the world malaria death rate with 79.3 per 100,000 individuals. It is estimated to be a risk for 97% of Nigeria's population and accounts for more cases of morbidity and deaths in the country. A large percentage of the Nigerian population lives in the rural areas and is mainly involved in agricultural activities. However, a

larger percentage of this rural population has been plague with several disease conditions with deleterious consequence on their health and livelihoods. One of such intractable diseases is malaria. It is estimated that as much as 13 per cent of rural household expenditure per month goes to malaria treatment alone (Akinpelu *et al.*, 2011).

Malaria have severe impact on agriculture through loss of agricultural labour due to illness and death, wastage of family members' time and energy in caring for malaria patients and mourning for people killed by malaria. Its peak transmission often coincides with peak physical activity required in agricultural activities, that is, the rainy season when planting and harvesting take place. Hence, having damaging impact on rural communities where most farming households reside.

It is estimated that at least 50% of the population experience at least one episode of malaria per year (Alaba and Alaba, 2009). In Nigeria, malaria incidence throughout the country had been on the increase over the years. In the cause and effect relationship between malaria and economic growth, it is also possible that the severity of malaria leads to poor health outcomes which in turn lead to a low gross national income and poor economic growth (World Bank, 2000; Arrese, 2001). Malaria reported cases between 1995 and 2010 are shown in Table 1.

**Table-1.** Malaria Morbidity and Mortality in Nigeria (1995-2009)

| Year | Average Morbidity | Average Mortality |
|------|-------------------|-------------------|
| 1995–1999 | 7,567,228 | 23,323 |
| 2000–2004 | 12,884,736 | 23,397 |
| 2005–2009 | 23,896,926 | 46,452 |

**Source:** NBS- Annual Abstract of Statistics (Various Editions).

Evidence on Nigeria from the table (see table 1)shows that malaria morbidity had been on increase ranging between 7.6 million between 1995 and 1999 and above 12 million by the turn of the millennium 2000, and beyond. Malaria mortality increases steadily between 1995 and 2004 but increases by almost 100% between 2005 and 2009. This indicates that the country has a long way to go in malaria prevention.

The government of Nigeria and development partners has responded to the malaria scourge with various interventions. These include the Roll-Back-Malaria programme, the Millennium Development Goals (Goal 6), National Malaria Programme, among others. As part of government effort to combat malaria in the country, goal 6 and target 8 of Millennium Development Goals (MDGs) is aimed at halting by 2015 and reversing the incidence of malaria and other major diseases. The core interventions for controlling malaria in Nigeria include distribution of long lasting insecticide-treated net through antenatal care clinics in the rural and urban areas, immunization visits, large-scale stand-alone campaigns and through subsidized and at-cost sales in the commercial sector. Others include intermittent preventive treatment for pregnant women, prompt diagnosis at the various levels of health care, indoor residual spraying, increased community awareness as well as provision of free artemisinin-based combination therapy (ACT) for children below and above five years of age in some health centers, in both rural and urban areas. Funds have also been given by Nigeria government and other international bodies like: World Health Organization, Global Fund, United Nations Children Emergency Funds (UNICEF), etc.

Despite these efforts of Nigerian government and stakeholders in health sector, malaria prevention and control seems to be arduous especially in the rural areas, where the poor and vulnerable population live. Given the intractable nature of malaria scourge in the rural communities of Nigeria, the questions which this study attempt to answer are:

    (i)      What quanta of resources have been invested by government on malaria control and eradication in the country?

    (ii)    Has malaria responded to public investment in its eradication? If, not what factors specifically account for it?

    (iii)   Are the current approaches sufficient to eradicate malaria in rural Nigeria?

(iv)     What can Nigeria government do to address the malaria eradication problems in the rural areas in the country?

### 1.1. Conceptual Underpinning and Literature Review

The role of the state/public sector in economic development is one of the oldest issues in economics. The state is an important institution in a country. So long as the state machinery is a synthesis of the political forces of the country, the state policies influence the development of the different sectors of the economy and can either help or hinder the process of sectorial balance.

Controversies still exist as to the ability to deliver or midwife development. In recent past, the argument was that the state or public sector investment could accelerate growth and development, especially in developing countries where market failure characterized economic activities.

Human capital is important in fostering economic development. It is a key determinant of growth and development. A country's ability to innovate and remain productive depends on the characteristics and quality of its human capital, of which health is one of the key elements. Human beings can be regarded, among other things, as a stock of capital. This human capital provides a flow of services that, utilized with time, can be used in employment to earn an income and other work-related rewards, or alternatively, in leisure to enhance human enjoyment and quality of life (Harold and Delworth, 2012).

It is reported that the quality and quantity of human capital in African countries, including Nigeria, have been continually affected by a low health status (Soyibo et al., 2005). Diseases take enormous toll on human health and well-being in Africa, and the burden of these diseases has increased in recent times. Among the diseases which have had heavy toll on Nigeria is malaria. It has become more than a health issue in the country. Malaria is the most prevalent of all major tropical diseases in the country. Soyibo et al. (2005) maintain that the magnitude of incidence and death due to it is in multiples of all other tropical diseases put together over the years.

Malaria is a protozoan disease transmitted by the Anopheles mosquito, caused by minute parasitic protozoa of the genus Plasmodium, which infect human and insect hosts alternatively. Malaria often times afflicts poor people who live in malaria-prone rural areas in poorly-constructed buildings which have little or no protection against mosquitoes attack. Peak transmission of malaria often coincides with peak period of physical activity required in agriculture, since malaria hits hardest during the rainy season when planting and harvesting take place. Because of the substantial number of people suffering from malaria, it takes increasing proportion of national health care budget.

Government of developing countries has had policies and programmes aimed at delivery of health care to the people. However, empirical literature on government delivery of public health shows mixed results. For instance, Ayorinde (2001) reported that despite the laudable objectives of development plans and efforts of the various governments in Nigeria to increase the expenditure on the provision of health facilities, inequitable distribution of such facilities has continued to frustrate the efficient administration of health services in Nigeria. Similarly, Filmer et al. (2000) observed that while the concept of primary health care as enshrined at the Alma Ata Conference in 1978 has dominated much of discussion of health policy in developing countries for the past decades, public budget for health is principally absorbed by public hospitals stuffed by doctors expensively trained at public expenses who use costly medical technologies to treat conditions of the urban elite. Thus, there seems to be a consensus among public health specialists who focus on developing countries that the existing allocation of health expenditures requires re-orientation toward primary health care.

According to the World Bank (2001) public health expenditure is a source of financial protection that helps to: promote better health; diagnose, prevent and treat illness; protect individuals and households against direct financial losses due to illness; give the poor a voice in their own destiny and make them active participants in the breaking away from the social exclusion in which they are often trapped. Over the years, public expenditure on health in Nigeria has always been far short of what was required especially the resources available to health

programme for the poor. In the Second National Development Plan (1970 − 74) which was launched shortly after the end of the Civil War (especially in the early 1970s), huge investments were made on health care infrastructure, especially with the policy of reconstruction of the war damaged areas as well as the reconstruction and development of the rest of the country. Between 1975 and 2001, the total public expenditure devoted to health care ranged between 0.59 and 3.85 per cent of the annual budget, except for 1995, 1997, 1999 and 2000 when it attained 5 and 7.32 per cent of the annual budget (Bello, 2005). This has not reached the WHO benchmark of 5 percent of GDP and 14 percent of the annual national budget. (Central Bank of Nigeria (CBN), 2004).

Empirical studies indicate that economic growth is promoted more by investment in human capital than in physical capital (Denison, 1974). Returns from human capital investment are realized as a flow of labor services through time (Harold and Delworth, 2012). Health as a capital good can either improve or reduce individuals' productive ability. Health affects agricultural system by affecting the health of the producers. Evidence suggests that illness affects farm production by reducing household's labour supply and the household's ability to effectively utilize resources (Singh *et al.*, 1986). The effect is higher among poor households who spend a significant proportion of their income on medical expenditures, and are less able to rely on employed labour, thus reducing farm output significantly (Urbanus, 2013).

Ernest (2011) analysed the dynamic direct and indirect effects of government policy on health and its relation to the cyclical economic growth in the long run. Using an integrated sequential dynamic computable general equilibrium (CGE) model to examine the potential impact of increase in government expenditure on health in Nigeria, the result showed that the re-allocation of government expenditure to health sector is significant in explaining economic growth in Nigeria. The author recommends that in order to achieve a steady economic growth, investment in health services should also receive great attention in the public investment portfolio.

Malaria mortality and morbidity are aggravated by a variety of factors, including poor laboratory diagnostic capacity, inadequate management, delayed or improper treatment by households, and limited public finding for malaria control and prevention (Bello, 2005). In determining the relationship between deaths from malaria and public health and non-health expenditure in Nigeria, Bello (2005) adopted Filmer and Pritcher model and the gross output transfer models on data from 1975-2001. The study revealed that there is a negative relationship between deaths from malaria, public health expenditure, per capita income, and non-public health expenditure, but a positive relationship between deaths from malaria and political instability. The study further found that between 1975 and 2001, an average of 5.86% of the GDP was lost to malaria deaths annually. The author recommended that in addition to the current N14,000 per capital health expenditure, a transfer of an additional N45,684.00 per head from other sectors to the health sector could go a long way in averting an additional death from malaria.

## 2. MATERIALS AND METHODS

### 2.1. Nature and Sources of Data

This paper focused on Nigerian government and international donor spending on malaria control and eradication in Nigeria, as well as total health spending in Nigeria and its effect on malaria control and eradication. It employed secondary data obtained from Annual Report and Statements of Account of the Central Bank of Nigeria, (various issues); publications of National Bureau of Statistics, Nigeria Household Survey Report and Nigeria Malaria Indicator Survey. Information on malaria funding was obtained from Roll-Back-Malaria website (www.rollbackmalaria.org).

### 2.2. Methods of Data Analysis

The data collected were analyzed using descriptive statistics namely proportions and percentages as well as graphs. Besides descriptive statistics, correlation and regression analyses were employed to gauge the relationships between malaria expenditure and malaria morbidity and mortality, as well as the effects of malaria expenditure on Health Gross Domestic Product. The correlation and regression models are presented below:

### 2.2.1. Correlation Models

(i)        Correlation (r) of Government Funding (Gy) and Malaria Morbidity (Xmorb)

$$\mathbf{r_{(Gy,Morb)}} = \frac{\sum(Gy-\overline{Gy})(Morb - \overline{Morb})}{\sum(Gy-\overline{Gy})^2 \sum(Morb - \overline{Morb})^2}$$

Where $\overline{Gy}$ and $\overline{Morb}$ are sample means of government funding and malaria morbidity respectively.

(ii)        Correlation (r) of Government Funding (Gy) and Malaria Mortality (Xmort)

$$\mathbf{r_{(Gy,Mort)}} = \frac{\sum(Gy-\overline{Gy})(Mort - \overline{Mort})}{\sum(Gy-\overline{Gy})^2 \sum(Mort - \overline{Mort})^2}$$

Where $\overline{Gy}$ and $\overline{Mort}$ are sample means of government funding and malaria mortality respectively.

(iii)        Correlation (r) of International Funding (Iy) and Malaria Morbidity (Xmorb)

$$r_{(Iy,Morb)} = \frac{\sum(Iy-\overline{Iy})(Morb - \overline{Morb})}{\sum(Iy-\overline{Iy})^2 \sum(Morb - \overline{Morb})^2}$$

Where $\overline{Iy}$ and $\overline{Morb}$ are sample means of international funding and malaria morbidity respectively.

(iv)        Correlation (r) of International Funding (Iy) and Malaria Mortality (Xmort

$$r_{(Iy,Mort)} = \frac{\sum(Iy-\overline{Iy})(Mort - \overline{Mort})}{\sum(Iy-\overline{Iy})^2 \sum(Mort - \overline{Mort})^2}$$

Where $\overline{Iy}$ and $\overline{Mort}$ are sample means of international funding and malaria mortality respectively.

(v)        Correlation (r) of Total malaria Funding (Ty) and Malaria Morbidity (Xmorb)

$$r_{(Ty,Morb)} = \frac{\sum(Ty-\overline{Ty})(Morb - \overline{Morb})}{\sum(Ty-\overline{Ty})^2 \sum(Morb - \overline{Morb})^2}$$

Where $\overline{Ty}$ and $\overline{Morb}$ are sample means of total malaria funding and malaria morbidity respectively.

(vi)        Correlation (r) of Total Malaria Funding (Ty) and Malaria Mortality (Xmort)

$$r_{(Ty,Mort)} = \frac{\sum(Ty-\overline{Ty})(Mort - \overline{Mort})}{\sum(Ty-\overline{Ty})^2 \sum(Mort - \overline{Mort})^2}$$

Where $\overline{Ty}$ and $\overline{Mort}$ are sample means of total malaria funding and malaria mortality respectively.


### 2.2.2. Regression Model

A regression model was used to ascertain the effects of malaria spending on health GDP and malaria morbidity. The implicit form of regression equation used is stated as:

$$GTS = f(HGDP, NHS, MI, PCGDP)$$

The explicit model is:

$$LnGTS = \beta_0 + \beta_1 LnHGDP + \beta_2 Ln\,NHS + \beta_3 LnMI + \beta_4 LnPCGDP + Uit$$

Where: GTS= Government total spending in the health sector i.e. recurrent and capital expenditure (Naira Million); HGDP= Health Gross Domestic Product (Naira Million); NHS= Non-health public expenditure (Naira Million); MI= Malaria Index= No of Malaria cases per 100,000 individuals; PCGDP= Per capital GDP= GDP/Total Population; Uit= stochastic error term; Ln= natural log; $\beta_0$=intercept; $\beta_1$-$\beta_4$= coefficients of explanatory variables.

Apriori, $\beta_3$ which is coefficient of malaria index is expected to be negatively signed.


### 2.2.3. Stationarity Test

The time series properties of the data used in the regression analysis were ascertained by carrying out stationarity test. Table 2 presents the results of the stationarity test (unit root test).

**Table-2.** Summary of the Stationarity Test

| Variables | Augmented Dickey Fuller | | |
|---|---|---|---|
| | At level Integration | Ist Difference | Order of |
| Total government spending on health (GHTS) | 0.477 | −6.301*** | I(1) |
| GDP of health sector (HGDP) | 1.350 | −8.044*** | I(1) |
| Non-health Public Expenditure (NHS) | 0.299 | −7.334*** | I(1) |
| Malaria Index (MI) | −1.001 | −9.871*** | I(1) |
| Per capital GDP (PCGDP) | −2.187 | −5.980*** | I(1) |

**Note:** ***= Significant at1%

The variables presented the unit root problem but were stationary at first difference that is integrated at order one I(1). This shows that a possible stable relationship between total government spending on health (GHTS) and the explanatory variables can only be obtained at first difference.

# 3. RESULTS

## 3.1. Public Investment in Malaria Control in Nigeria

As shown in table 3, there have been variations in malaria funding by Nigeria government and international partners. Nigerian government funding ranged between 92million USD to 14 billion USD and fluctuated from year to year. There was a decline in the funding between 2003 and 2004 as well as between 2008 and 2009. While the funding was stagnant between 2006 and 2007, it increased sharply in 2010. Funds received from international donors ranged between 1billion USD to about 142 billion USD with fluctuations from year to year. There was a steady rise in the funding between 2001 and 2003 after which a decline was experienced in 2004. More funds were received the following year (i.e. 2005) while 2010 and 2011 experienced decline in funding.

**Table-3.** Malaria Funding, Morbidity and Mortality in Nigeria: Stylized Facts.

| Year | Funding from Nigeria Government USD Mil. | % change in Govt. funding | Funding from Other Partners USD Mil. | % change in Others funding | Malaria Morbidity | % change in Malaria Morbidity | Malaria Mortality | % change in Malaria Mortality |
|---|---|---|---|---|---|---|---|---|
| 2000 | 0 | - | 1,000,000 | - | 2,388,096 | - | 5,465 | - |
| 2001 | 2,020,000 | - | 1,100,000 | 10 | 2,220,348 | −7.02 | 4,207 | −23.02 |
| 2002 | 4,000,000 | 98 | 1,400,000 | 27.27 | 2,535,430 | 14.19 | 3,616 | −14.05 |
| 2003 | 3,530,000 | −11.75 | 1,870,000 | 33.57 | 2,631,696 | 3.80 | 4,057 | 12.20 |
| 2004 | 92,308 | −97.39 | 1,600,000 | −14.44 | 3,109,166 | 18.14 | 6,052 | 49.17 |
| 2005 | 384,615 | 316.66 | 16,700,000 | 943.75 | 3,183,072 | 2.38 | 6,495 | 7.32 |
| 2006 | 11,000,000 | 2760 | 20,000,000 | 19.76 | 3,547,830 | 11.46 | 6,586 | 1.40 |
| 2007 | 11,000,000 | 0 | 58,200,000 | 191 | 5,334,402 | 50.36 | 10,662 | 61.89 |
| 2008 | 14,324,952 | 30.23 | 84,742,840 | 45.61 | 5,317,764 | −0.31 | 10,219 | −4.15 |
| 2009 | 200,000 | −98.60 | 141,800,000 | 67.33 | 6,513,858 | 22.49 | 12,490 | 22.22 |
| 2010 | 6,493,506 | 3146.75 | 117,506,494 | −17.13 | 4,569,804 | −29.84 | 4,308 | −65.51 |
| 2011 | 2,493,181 | 61.61 | 73,375,766 | −37.55 | 5,085,533 | 11.29 | 3,222 | −25.21 |

**Source:** www.rollbackmalaria.org/financing/mfdp.html and Authors' Computations.

## 3.2. Response of Malaria Morbidity and Mortality to Public Investment

### 3.2.1. Response of Malaria Morbidity and Mortality to Funds Received from Nigerian Government and International Donors

The values for figures 1, 2 and 3 were gotten from table 3. From figure 1 above, it is interesting to note that when Nigerian government funding decreased between 2003 and 2004, there was a drastic rise in malaria mortality. However, when the funding from Nigerian government increased the following year, (i.e. 2005), malaria mortality decreased. Stagnation in the government funding as noticed in the year 2006 and 2007 led to drastic rise in mortality.

The peak in funding by the government was experienced in 2010, in which malaria mortality received the lowest decline. Funding received from other partners (i.e. international donors) had a varied effect on malaria mortality. When the funding from international donors increased between 2001 and 2002, there was a decline in

mortality but increased funding in 2003, 2007 and the year 2009 led to increase in mortality while decline in funding between 2010 and 2011 led to decline in mortality.
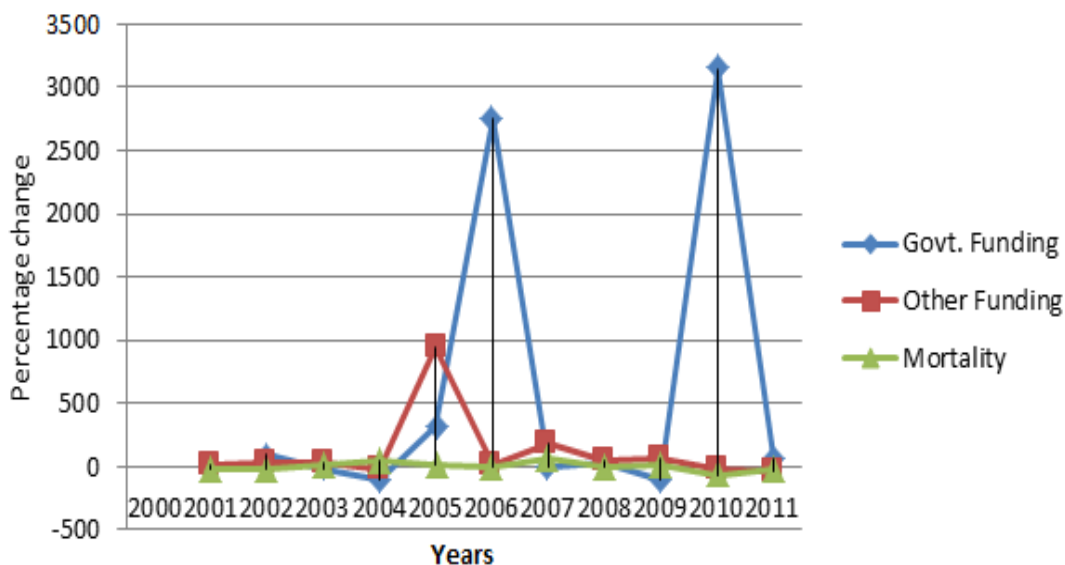


**Figure-1.** Percentage change in malaria mortality and malaria funding in Nigeria
**Source:** www.rollbackmalaria.org/financing/mfdp.html and Authors' computation

In figure 2, there had been decrease in malaria morbidity with increase in Nigerian government funding. Between 2005- 2006 and 2009 - 2010 when there was increase in the government spending, there was fall in malaria morbidity. It is worth noting that increase in the government spending in 2006 did not lead to decline in malaria morbidity. However, there had been fluctuations in malaria morbidity and funds received from international donors. For example, between 2004 and 2005 when the funding reached its peak, malaria morbidity dropped drastically but increased in funding in 2007 was accompanied with increase in morbidity.
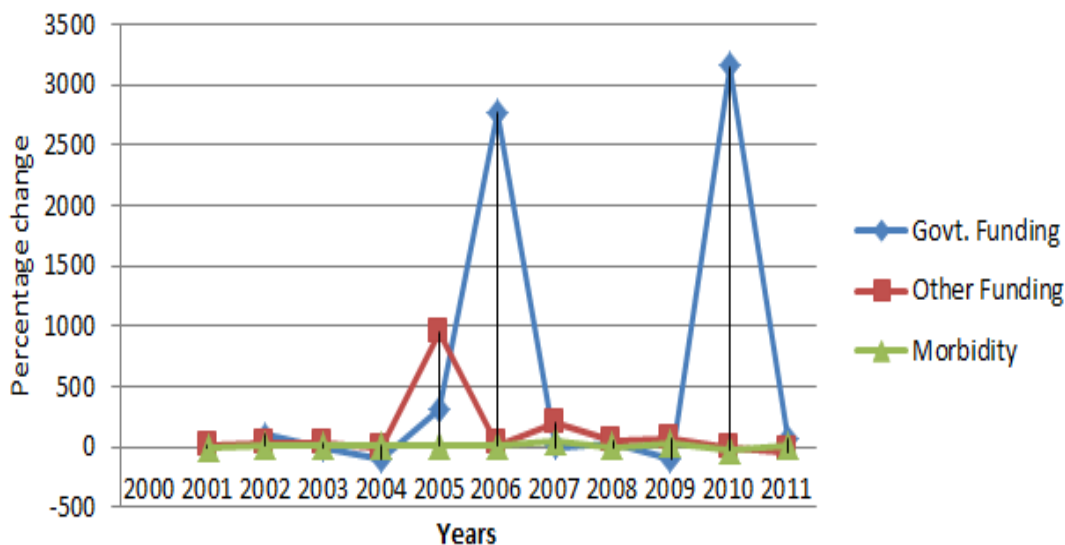


**Figure-2.** Percentage change in malaria morbidity and malaria funding in Nigeria
**Source:** www.rollbackmalaria.org/financing/mfdp.html and Authors' computation

Figure 3 gives the summary of percentage change in malaria mortality and morbidity in relation to percentage change in total funding. In summary, there has been a rise and fall in changes in malaria morbidity/ mortality. There was a rise in mortality and morbidity in 2004, when funding received from both Nigerian government and other partners declined. However, in 2005, when there was a peak in funding, malaria morbidity and mortality

decreased. This suggests that combination of funds received from home and abroad had little impact in bringing down the pandemic to an extent.
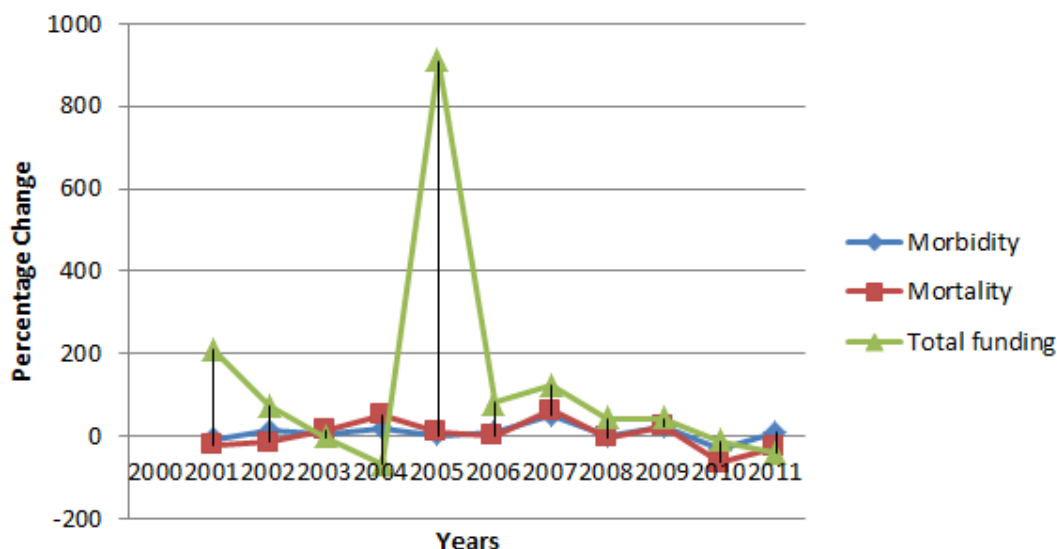


**Figure-3.** Percentage change in malaria morbidity/ mortality and total funding in Nigeria
**Source:** www.rollbackmalaria.org/financing/mfdp.html and Authors' computation

### 3.2.2. Malaria Response to Public Investment: Correlation Analysis

Table 4 below shows the result of the correlation between malaria and government spending / other international funding. There is a strong positive relationship between malaria morbidity, malaria mortality and fund received from international partners. This implies that as more funds are pumped into malaria control and eradication, more cases of malaria morbidity and mortality are experienced. The same applies to funds given by Nigerian government expect that the relationship between the funds and malaria morbidity and mortality is weak. However, the combination of funds received from international partners and Nigerian government has helped to stem the tide of malaria morbidity (though little) in Nigeria. This is indicated by the negative relationship between malaria morbidity and total malaria funding (-0.27).

**Table-4.** Results of Correlation between Malaria Morbidity, Malaria Mortality and Malaria funding in Nigeria

|   | Variables Description | Correlation Coefficient |
|---|---|---|
| 1 | Government Funding and Malaria Morbidity | 0.358297 |
| 2 | Government Funding and Malaria Mortality | 0.339382 |
| 3 | Funding from other Partners and Malaria Morbidity | 0.913798 |
| 4 | Funding from other Partners and malaria Mortality | 0.542467 |
| 5 | Total Malaria Funding and Malaria Morbidity | −0.26508 |
| 6 | Total Malaria Funding and Malaria Mortality | 0.560147 |

### 3.2.3. Malaria Response to Public Investment: Regression Analysis

Table 5 presents the result of regression analysis. As shown in Table 5, the gross domestic product of the health sector (LNHGDP), and Malaria Index (MI) significantly explain the total Nigerian government spending on health. Specifically, the coefficients of these variables are positive and significant at 1% critical level. This implies that the more Nigerian government spends on health sector, the more the cases of malaria in the country. This confirms the correlation result. Other variables mentioned earlier in table 2 i.e. non-health public expenditure and per capital GDP were not significant in explaining the relationship between government total health spending and malaria morbidity and mortality in the country.

**Table-5.** The Ordinary Least Square (OLS) Result

| Variable | Coefficient | Std. Error | t-Statistics |
|---|---|---|---|
| LNHGDP | 112609.2 | 23217.77 | 4.850*** |
| LNMI | 50302.36 | 8675.609 | 5.798*** |
| C | -948985.5 | 88007.34 | -10.783*** |
| R-square | 0.910 | | |
| Adjusted R-square | 0.898 | | |
| Durbin-Watson stat | 1.842 | | |
| F-statistic | 76.224*** | | |

**Note:** *** = Significant at 1% level

### 3.3. Nigerian Government Approach to Eradicating Malaria in the Rural Areas

In this section, the approaches adopted by Nigerian government to control malaria in the rural communities are reviewed. The programmes reviewed include: National Primary Health Care, Roll Back Malaria Initiatives, Millennium Development Goals, National Malaria Programme.

National Primary Health Care: The National Primary Health Care Development Agency (NPHCDA) is a parastatal of Nigeria's Federal Ministry of Health whose mandate is to develop national primary health care (PHC) policy and support states and LGAs to implement them. It was established to Achieve Health for All Nigerians, by the year 2000.The goals of the agency include: controlling preventable diseases, improving access to basic health services, improving quality of care, strengthening of institutions, developing a high- performing and empowered health workforce, strengthening partnerships and engaging communities.

The system was developed and strengthened and this helped to improve some of the health status indicators. Among other things, distribution of Insecticide Treated Nets (ITNs) and availability of Artemisin Therapy (ACTs) to the rural communities had been carried out, as well as routine immunization coverage which had led to reduction in infant and child mortality rates. Unfortunately, this routine immunization was not sustained. There has been a downward trend in health development since 1993 (Federal Ministry of Health (FMH), 2004). This could be traced to high prevalence of poverty in the rural areas. Hence, there is a need to improve the health of Nigerians not only to break the vicious circle of ill-health, poverty and low level of development but to convert it to the virtuous circle of improved health status, increased well-being and sustainable development (FMH, 2004). Apart from this, most of the rural areas do not have access to good health care systems. Usually there are no accessible roads to the health centers, which are often times poorly equipped and have inadequate drugs for malaria treatment. This has led to abandoning of such facilities in some communities and hence self-medications are often carried out at home and at times visiting of traditional healers. Since the majority of rural dwellers lack basic education required to reading and sticking to instructions stipulated, irrational use of antimalarial drugs are often encouraged.

Roll Back Malaria Initiative: The Roll Back Malaria (RBM) focuses on the three major interventions which include case management, promotion of intermittent preventive treatment (IPT) and the use of insecticide treated nets (ITNs)/Vector management. All these are aimed at reducing malaria burden and mortality prevention both in children and in pregnant women, empowering individuals and communities as well as ensuring effective programme management. Efforts carried out by RBM include distribution of insecticide treated nets to primary health centers, distribution of artemisin therapy to some health centers in the rural areas, habitat elimination or modification. Efforts have been introduced to reduce the abundance of all mosquitoes as well as more targeted projects of "species sanitation" directed at the principal malaria vectors (Colluzi, 1992).

However, the setbacks experienced include: increase in resistance of malaria parasites to drugs, non-availability of new and very effective anti-malaria commodities (e.g.ACTs and ITNs) for prevention of malaria; limited resources to reach out to more than 133million Nigerians in about 10,000 wards; inadequate funding for effective programme management; a weak and constrained health system that may not cope with added pressure of a national programme expansion, lack of knowledge on the interaction of the package of interventions and outcomes.

Notwithstanding the weaknesses, there has been a well-established and effective RBM partnership especially at the national level, an increased resource based and a core of well trained staff at national level coordinators.

Millennium Development Goals: At the international level, in September 2000 the United Nations Millennium Summit endorsed the Millennium Development Goals (MDGs) in what was called the "Millennium Declaration". The main objective of the Millennium summit was to set quantifiable and times bound global development goals to end human suffering from hungers, destitution and disease mainly in developing countries. Malaria features prominently in the Millennium Development Goals, in which malaria control and prevention capture about six goals (i.e goals 1,2,4,5,6 and 8) out of the eight goals of the MDGs. Therefore, any effort geared at achieving the six goals, will go a long way in preventing and eradicating malaria in rural areas.

The major limitation to the achievement of these goals as mentioned under RBM is limited resources to reach out to more than 133 million people residing in the 774 LGAs (about 10,000 wards) of Nigeria, especially in the rural areas.

National Malaria Programme (NMP): The NMP developed malaria control plan builds on the National Malaria Strategic Plan (NMSP) for Malaria Control in partnership with the RBM Partners, States' Ministries of Health and other Stakeholders to enable national scale-up of key preventive and curative interventions. This malaria strategic plan addresses national health and development priorities, including the Roll Back Malaria (RBM) Goals and the Millennium Development Goals (MDGs). The plan aims at reducing malaria mortality and morbidity to improve health status, lower health care costs as well as have other socio –economic impact. Malaria control has been incorporated into the existing health care delivery system which is aimed at providing malaria treatment and prevention services as close to the client as possible, both in the rural and urban areas.

The National Malaria Control Program (NMCP) has delivered about 17 million ITNs during 2005-2007 (6.6 million Long Lasting Insecticidal Nets), and about 4.5 million single dose packages of ACT in 2006 and 9 million in 2007 to both rural and urban areas. Despite these efforts of NMCP, the available resources are not sufficient to reach national targets for prevention and cure. This has reduced the effectiveness of the programme.

## 4. DISCUSSION

There have been variations in malaria funding by Nigeria government and international partners. Funding received from international donor has not really had a positive result as expected on malaria mortality in the country, while that of government had helped to reduce mortality in the country to an extent. This suggests that combination of funds received from home and abroad had little impact in bringing down the pandemic to an extent. Perhaps, the present approaches are not effective enough to control and prevent malaria in Nigeria. There is need for review of the approaches adopted to stem down morbidity and mortality, so as to justify these quantum of resources invested.

The strong positive relationship between malaria morbidity, malaria mortality and fund received from international partners is an indication that as more funds are pumped into malaria control and eradication, more cases of malaria morbidity and mortality are experienced. The same applies to funds given by Nigerian government except that the relationship between the funds and malaria morbidity and mortality is weak. This is at variant with the study carried out by Bello (2005) who observed that there is a negative relationship between deaths from malaria and public health expenditure. This suggests that other factors other than finance are responsible for the problems of malaria prevalence in the country. This calls for proper monitoring of all funds available for malaria control and eradication in the country. This will go a long way in bringing down this giant and ensuring the health and productivity of rural communities. Another reason for this may be that present measures used in malaria control and prevention may not be effective enough to produce desired results. Hence, there is need to review malaria control and eradication strategies so as to make room for better approach towards its elimination in the country.

In summary, the current approaches had helped a little to stem down malaria mortality in the country. Effort should be geared towards more effective approaches toward eradication of malaria in the country. For example report from Malaria Indicator Survey (MIS), Household Survey Report (HSR) and Demographic and Health Survey (DHS) carried out in the country between 2003 and 2010 revealed that non-compliance of Nigerian with malaria control programme especially with the use on ITNs and environmental sanitations, had led to increase in malaria morbidity in the rural areas.

## 5. CONCLUSION

This study has shown that successive Nigerian administrations have made attempts to control malaria disease in the rural areas. However, these efforts have not yielded consistent results. Malaria morbidity and mortality experienced inter-annual fluctuations. In the same vein, funding of malaria control from both Nigerian government and development partners were also found to fluctuate. Estimate of the association between sources of funding and malaria revealed positive association with malaria morbidity and mortality, except total expenditure. This implies that Nigerian government and international donor funding are yet to have expected results on malaria eradication and control. This testifies to the need of alternatives to these approaches. Perhaps, complete extermination of malaria vectors is the surest way to deal with malaria in Nigeria. To reverse this situation, it is recommended that the following measures should be taken:

Antimalarial drugs should be made available at subsidised price within the reach of the people in the rural communities; while community leaders can be used to create achievable goals towards malaria prevention and eradication and introduce sanctions for erring members in the community.

There should be more funding for researches in the use of predators (e.g. predator-mosquitocidal fungi)  as a means of controlling malaria.

Malaria vaccine development should also be intensified. This will help in total eradication of malaria in Nigeria while funds released for malaria eradication and control should be properly supervised.

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